Engineering GPCR signaling pathways with RASSLs.

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Public Summary:

Scientific Abstract:
We are creating families of designer G protein-coupled receptors (GPCRs) to allow for precise spatiotemporal control of GPCR signaling in vivo. These engineered GPCRs, called receptors activated solely by synthetic ligands (RASSLs), are unresponsive to endogenous ligands but can be activated by nanomolar concentrations of pharmacologically inert, drug-like small molecules. Currently, RASSLs exist for the three major GPCR signaling pathways (G(s), G(i) and G(q)). We review these advances here to facilitate the use of these powerful and diverse tools.